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REGULAR ARTICLE

Sexual goals and perceptions of goal congruence in individuals' PrEP adoption decisions: A mixed-methods study of gay and bisexual men who are in primary relationships.

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Abstract

Background: Although health goals are recognized as a central feature of health behavior theories, the relational context through which goals are conceptualized is often overlooked. Interdependence theory represents a valuable framework for understanding goals in the adoption of health behaviors, such as pre-exposure prophylaxis (PrEP), among gay and bisexual men in primary relationships.

Purpose: We examined the content and focus of men's sexual health goals, as well as whether goal content, goal focus, or perceptions of goal congruence with a primary partner were related to PrEP adoption among gay and bisexual men in primary relationships.

Methods: Mixed-methods data were collected from a PrEP demonstration project from 145 HIV-negative gay and bisexual men in primary relationships. Participants reported their sexual health goals and completed measures of perceptions of goal congruence, relationship factors, and sociodemographic factors.

Results: Three main goal content categories were identified: prevention, satisfaction, and intimacy. In expressing these goals, participants framed them with either a self-focus or a relationship-focus. Men in serodiscordant relationships reported more intimacy goals and greater perceptions of goal congruence. There were no differences in goal content or focus by sexual agreement. In the multivariable logistic regression model, perceived goal congruence was associated with PrEP adoption, over and above covariates.

Conclusions: Intimate relationships play a significant role in the formation of health-related goals. Goal content, focus, and perceived congruence with partners may represent important targets for HIV prevention interventions for gay and bisexual men in primary relationships, especially in the context of PrEP.

Keywords: goal congruence, gay and bisexual men, pre-exposure prophylaxis, HIV prevention, relationships

Introduction

Goals are a central feature of most theories of health behavior change, positing that individuals will succeed in adoption and persistence of a new health behavior to the extent that it is consistent with their goals and priorities [1]. Social cognitive theory postulates that goals are an interlinked aspect of self-motivation to engage in a particular behavior and that individuals engage in behaviors depending on their goal aspirations [2]. Numerous studies have found that the pursuit of personal goals and goal attainment are positively related to health and well-being [3–6]. However, both theory and research on health goals often ignore the *relational* context through which these goals are constructed, initiated, and subsequently sustained [7, 8].

A large body of empirical evidence illustrates the importance of romantic partners and intimate relationships in the adoption of health behaviors [9, 10].

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Romantic partners have the potential to either support or undermine health behavior commitments [11, 12]. On one hand, studies have found that romantic partners can have a positive influence on health behaviors, such as diet, exercise, and smoking cessation [13, 14]. On the other hand, studies have found that partners can have a negative impact or curtail these exact same health behaviors [15, 16]. Most often these contradictory findings have been explained as a function of the quality of the relationship. For example, partners are most likely to have a positive influence on health behaviors when they have shared goals and open communication strategies, and utilize desired or wanted control tactics [9, 11].

Individuals in close, romantic relationships often consider their romantic partner in setting goals rather than pursuing only individualistic goals [7]. Theories from social psychology and relationship science propose that the coordination of goals with a romantic partner occurs in the context of both major life goals and everyday or mundane goals [17]. Interdependence theory distinguishes between self- and relationship-focused goals in understanding relationship functioning [9, 18, 19]. Specifically, interdependence theory posits that individuals in committed relationships may transform their motivations such that their goals may be more "relationship-focused" rather than "self-focused," and that more "relationship-focused" goals produce better outcomes for each partner and the relationship [19, 20]. Interdependence theory also postulates that *perceptions of goal congruence,* rather than specific goal focus per se, may be related to improved well-being for romantic partners [7]. Gere and colleagues (2011) use the term *goal-congruence* to describe when individuals perceive that their goals are similar or complementary to their partners' whereas *goal-incongruence* refer to situations in which goals are perceived to be contradictory. Despite the centrality of goals in health behavior change, few studies have examined whether the focus of the goal or perceptions of goal congruence are associated with an individual's decisions to adopt health behaviors.

The Relational Context of HIV Prevention

Understanding goals is particularly important for sexual health, which is often negotiated in the context of intimate relationships. In the United States, gay, bisexual and other men who have sex with men (GBMSM) are most heavily impacted by the HIV/AIDS epidemic; epidemiological evidence suggests that up to two-thirds of HIV infections among GBMSM occur in the context of a romantic and intimate partnership [21, 22]. Given the relational context of HIV risk, a growing body of literature has shown that indicators of relationship quality (e.g., relationship satisfaction, commitment, sexual satisfaction) can be both positively and negatively associated with sexual risk behaviors among GBMSM [23–25]. Some studies have demonstrated that self-reports of positive relationship quality such as intimacy, closeness, and commitment are related to increased engagement in condomless sex with primary partners [25, 26] whereas other studies have shown that these measures of relationship quality can promote engaging in consistent condom use with primary partners [27–29].

A growing body of literature has focused on sexual agreements as a dimension of relationship quality and as an outcome within HIV prevention research for GBMSM in primary partnerships. Sexual agreements are defined as the decisions couples make about whether they allow sex with outside partners and what sexual behaviors (including condom use practices) are acceptable with outside partners [30, 31]. Many studies have examined correlates of sexual agreements, including the couple's HIV status and self-report measures of relationship quality (e.g., relationship satisfaction, commitment, and sexual satisfaction); other studies have examined the association between sexual agreements and HIV prevention behaviors, including HIV testing behaviors [26, 30, 32–38]. Several couples-based interventions have been designed to help couples develop a sexual agreement in the context of HIV prevention interventions, such as Couples HIV Testing and Counseling [39, 40]. Although this research has been critical in advancing HIV prevention efforts for GBMSM in primary partnerships, there has been limited research addressing whether the types of sexual goals and perceptions of goal congruence may influence the adoption of biomedical HIV prevention strategies.

HIV pre-exposure prophylaxis (PrEP) is a promising biomedical HIV prevention technology that has revolutionized HIV prevention research and intervention efforts. PrEP is an FDA-approved once-daily pill that, when taken consistently, lowers the risk of HIV infection by over 98% [41]. Similar to oral contraception methods, PrEP is a prevention strategy that can be used without a partners' knowledge or involvement. However, for those in relationships, partners may be critical in PrEP adoption. For example, research suggests that indicators of relationship quality, specifically intimacy motivations to engage in condomless anal sex (CAS) and desiring more closeness with a primary partner, are both related to PrEP adoption among GBMSM in romantic relationships regardless of their sexual agreement [42]. Some evidence suggests that HIV-negative GBMSM in seroconcordant negative relationships (i.e., couples in which both members are HIV-negative) and serodiscordant relationships (i.e., couples in which the other partner is living with HIV) view PrEP favorably [43, 44] and may even persuade their partner to go on PrEP when they intend to take PrEP themselves [45].

On the other hand, there has been a potential concern raised that initiating PrEP may be an excuse for individuals to engage in risky behaviors [46], which may negatively impact relationship persistence [47].

The Current Study

Despite the potential importance of PrEP as a prevention strategy, there has been limited research understanding the role of goals in gay and bisexual men who are in primary relationship PrEP adoption decisions, over and above indicators of relationship quality such as commitment, relationship quality, and sexual satisfaction [48, 49]. In a previous analysis of data from this PrEP demonstration project [42], we found that one aspect of relationship quality, specifically closeness, was associated with PrEP adoption. This paper extends this work to examine the role of goals in PrEP adoption. Interdependence theory [9, 19] posits that *relationship-focused goals* are more associated with PrEP adoption for GBMSM in primary partnerships, compared to *self-focused goals*. In contrast, Gere and colleagues (2011) would argue that perceptions of *goal congruence* would be the strongest predictor of PrEP adoption, regardless of the content or focus of the goal. Guided by interdependence theory, the purpose of this study was to understand the role that goals may play in the decisions of GBMSM who are in primary relationships to take PrEP. Through mixed-methods analyses, we sought to examine: 1) the content and focus of HIV-negative GBMSM's reports of their sexual health goals and priorities, and 2) the impact of goal content, focus, and perceptions of goal congruence in predicting PrEP adoption, over and above other relationship and demographic factors.

Methods

Participants and Procedures

The details of the study have been described elsewhere [42]. Participants were part of the SPARK project, a PrEP demonstration-implementation project conducted in collaboration with Callen-Lorde Community Health Center in New York City. SPARK participants were recruited through medical provider or counselor referral at the health center. Eligible participants [1]: were patients of the health center [2]; were assigned male sex at birth [3]; were at least 18 years old [4]; tested HIV-negative; and [5] met health center criteria for PrEP eligibility. Between January 2014 and October 2015, participants who screened eligible for the study were offered participation in the full demonstration project in which they would receive 12-months of PrEP medication, or in a comparison arm, in which they would receive similar 12-month follow up but would not begin PrEP. All participants completed a self-administered online survey immediately following the screening visit. As such, all data included in this analysis were collected after participants had indicated whether or not they were interested in PrEP adoption, but prior to the prescription visit (for patients who had chosen to adopt PrEP). We enrolled 300 individuals in the PrEP arm and 131 individuals in the comparison arm. The analyses in this paper are restricted to the 145 cisgender male participants (97 in the PrEP arm and 48 in the comparison arm) who reported having a primary partner for at least 3 months prior to their screening visit. All procedures were reviewed and approved by the Human Research Protections Program at the City University of New York.

As shown in Table 3, the sample ranged in age from 21 to 63 (M = 34.30; SD = 8.96). A little less than half of the sample identified as a person of color: 11.0% Black; 20.0% Latino, and 15.9% Other. In total, 75.8% of the sample self-identified as gay and 13.1% self-identified as bisexual. The sample was relatively diverse in regards to socioeconomic status, with 34.5% reporting less than a Bachelor's Degree and 32.4% reporting an annual income of less than $20,000 per year. One third of participants reported that their primary partner was HIV-positive and 58% reported that their primary partner was HIV-negative. Nearly seventy percent of participants reported that they were not in a monogamous relationship. The majority (n = 79, 81.4%) remained in their relationship over the three-month follow-up period.

Procedures

Sexual Goals and Priorities

During the baseline quantitative survey, men who reported that they were currently in a primary partnership were asked to answer in an open-ended format: "How would you describe your sexual priorities?" Participants provided text response ranging from 8 to 459 characters.

Qualitative Analysis

First, we used a framework analysis for the open-ended sexual priority responses, which is particularly well-suited to studies that attempt to answer a focused set of questions. Consistent with the steps outlined in framework analyses, all authors began by familiarizing themselves with the responses. Second, we devised and refined a thematic framework for coding by reading the data, identifying the themes that emerged, and writing analytic memos about those themes. Over a series of meetings, the authors read and re-read the data, discussed themes that

emerged around men's sexual goals, and wrote analytic memos about those themes. Through an iterative process of discussion and review, the recurring theme of men's views of their sexual health goals as relationship-focused and self-focused came into focus. Next, the first author and another coder indexed the data, identifying specific sections and coding different sexual priorities, which corresponded with our themes. All analyses were double coded and reliability was assessed using Cohen's kappa (k=0.94). All authors refined the relationships between the indexed data and the original thematic framework, interpreting themes, and contextualizing their meaning within and across participants.

Quantitative Measures

PrEP Adoption

Participants who met PrEP eligibility criteria at the health center were offered a PrEP prescription. Our primary dependent variable for quantitative analyses was defined as the individual's decision about whether or not to begin PrEP (Yes/No).

Demographics

Participants reported their partner's HIV status (HIV-positive, HIV-negative, unsure), their perceptions of their sexual agreement with their partner (open, monogamous, no agreement), as well as their own sexual identity, race/ethnicity, education level and income level.

Perceptions of Goal Congruence

To measure perceptions of sexual health goal congruence, we adapted an existing measure of goal congruence regarding goals broadly defined [8]. Specifically, we adapted the measure to assess perceptions of joint agreement on their sexual health goals with their partner. Participants responded on 4-point likert scale ranging from Strongly Disagree to Strongly Agree. An exploratory principal component analysis (PCA) was performed to examine the underlying factor structure of the five-item scale. Descriptive data and PCA loadings for each of the items are presented in Table 1, including eigenvalues, percentage of variance for each factor, the factor loadings for the two-factor solution, and the internal consistency reliability coefficient (Cronbach's α). The scale approximated multivariate normality as indicated by Kaiser-Meyer-Olkin value of 0.89 and significant Bartlett's test of sphericity: $\chi^2(10, n = 144)=618.28$, $p < 0.001$ [50]. Factor retention was decided by examining eigenvalues, scree plot, and interpretability of factors, which all suggested a one-factor solution (eigenvalue=4.00, 80.0% of variance explained). The scale demonstrated good internal consistency in the sample (α=0.94).

Relationship Quality

Participants completed two subscales of relationship commitment and satisfaction [20], which have been correlated with the dyadic adjustment scale [51]. Commitment level was assessed with three items assessing their commitment to their current partner (example item: "I want our relationship to last for a very long time"), with response options ranging from 0= Do Not Agree At All to 8=Completely Agree. Participants also completed three items from the satisfaction subscale (example item: "All things considered, to what degree do you feel satisfied with your relationship?"), with response options ranging from 0=Not at all Satisfied to 8=Completely Satisfied. Both the commitment level and satisfaction level subscales demonstrated good internal consistency in the current sample (α = 0.76 for commitment level; α = 0.93 for satisfaction level).

Sexual satisfaction

Participants completed the 5-item sexual satisfaction subscale from the Multidimensional Sexuality

Table 1. *Principal Component Analysis of Perceptions of Goal Congruence Scale (N = 145)*

Items:	Factor 1
1.I feel like my partner and I are "on the same page" in terms of the decisions we make about sexual health and risk.	0.92
2.When it comes to sexual decision-making, I feel like my partner and I are "of the same mind."	0.91
3.Sometimes I feel like my priorities for my sexual health are incompatible with my partner's goals. (reverse code)	0.86
4.I'm confident that my partner and I generally share the same priorities when it comes to sexual health.	0.86
5.Making sexual health decisions with my partner can be difficult because we have different priorities. (reverse code)	0.92
Eigenvalues	4.0
% of Variance	80.0
Theoretical Scale Score Range	5–20
Cronbach's Alpha (α)	0.94

Note: Varimax Rotation with Kaiser Normalization

Questionnaire [52], which assesses the extent to which individuals feel that they have a satisfying sex life (example item: "I am satisfied with the sexual aspects of my life), with response options ranging from 0=Not at all Characteristic of Me to 4=Very Characteristic of Me. The sexual satisfaction subscale demonstrated good internal consistency in the current sample (α =0.90).

Risk Perception

Participants were asked to rate their perceived likelihood of getting infected with HIV in their lifetime, on a scale ranging from 0 to 100. This measure has been used in other studies with GBMSM [53, 54].

Sexual Behavior

Participants were asked 92 questions about their sexual behaviors in the past 90 days by relationship status, HIV status, and gender identity. Specifically, participants were asked to report the number of times that they had engaged in different sexual behaviors with or without a condom (e.g., oral, mutual masturbation, vaginal, anal insertive, anal receptive) with a main partner or causal partners of different HIV statuses (i.e., HIV-positive, HIV-negative, unknown) and gender identities (i.e., male, female, transgender women, transgender men). We created a dichotomous variable of any condomless anal insertive or receptive sex with a casual partner of any HIV status or gender identity (Yes/No).

Quantitative Analyses

Descriptive statistics were obtained for all variables in the analyses, including examining the distribution of scale scores, with appropriate tests for normality. We then examined differences in goal content and focus by perceptions of goal congruence using a series of independent t-tests. Bivariate Pearson's and spearman's correlation analyses were then conducted to examine the associations between goal content, goal focus, perceptions of goal congruence, and relationship variables, such as commitment, relationship satisfaction, and sexual satisfaction. We then fit a series of independent samples t-tests and Chi-squares to examine whether there were bivariate differences in goal content or perceptions of goal congruence by PrEP adoption among the participants who decided to take PrEP. Finally, we fit a multivariable logistic regression model to assess whether goal content or perceptions of sexual health goal congruence were associated with PrEP adoption, over and above covariates. Finally, we used the Bonferroni correction to decrease the potential for Type-I error due to the multiple bivariate analyses.

Results

Content and Focus of Sexual Health Goals

In coding men's sexual health goals, three main content categories were identified: prevention goals, satisfaction goals, and intimacy goals. In expressing these goals, participants framed them with two types of foci –goals were either self-focused or relationship-focused. Below, we describe each of the three types of goals, layered with each of the two foci.

Prevention Goals

Participants who described their sexual health goals in terms of prevention (n =123, 84.8%) described their priorities in terms of protecting themselves, their partner, and relationship from HIV and other STIs. The majority of prevention goals were more self-focused, with participants' specifically emphasizing their *own* sexual health (n = 82, 68.9%).

> "*My priority is being HIV-negative, being STD-free, and being healthy.*" Unsure of partners' HIV status, no sexual agreement, age 26.

Some of these participants spoke about strategies they use to achieve these prevention goals, and most of these descriptions focused on combination prevention.

> *"My sexual health priority is to remain HIV-negative by taking PrEP and using condoms for oral & anal sex, likewise dental dams for rimming."* HIV-positive partner, open agreement, age 23.

> *"Staying HIV negative with the help of PrEP and using condoms when necessary"* HIV-negative partner, open agreement, age 31.

In contrast, the small number of individuals who reported prevention goals with a relational focus incorporated their partner's sexual health into these descriptions (n = 37, 31.1%).

> "*Staying negative, and making sure my partner stays negative*." HIV-negative partner, open agreement, age 55.

> *"To stay negative. To keep my partner negative. Using condoms with outside partners and choosing partners who I know are sober and test regularly, or are on effective suppression therapy if they are positive."* HIV-negative partner, open agreement, age 36.

As evinced by this last quote, relationally-focused prevention goals were often expressed by individuals in HIV-negative, open agreement relationships. These individuals were conscious of the responsibility of keeping both themselves and their partners' HIV-negative and STD-free, and were knowledgeable about prevention strategies.

Satisfaction Goals

Another goal that was frequently mentioned by participants was sexual satisfaction (n = 55, 39.0%). As with prevention goals, some participants expressed sexual satisfaction goals that were primarily self-focused (n = 30, 17.7% of total sample; 45.5% of satisfaction goals).

> "*Finding partners who can fulfill my requested sexual needs and desires*" Unsure of partners HIV status, open agreement, age 26.

Many of these participants combined sexual satisfaction and prevention goals (n = 41, 28.3% of total, 74.5% of sexual satisfaction goals), expressing a desire to balance the two.

> *"My sexual health priority is to stay as healthy as possible while having sex the way I want, when I want."* HIV-positive partner, monogamous agreement, age 32.

> *"Having as much fun as possible in a managed risk way."* HIV-negative partner, Open sexual agreement, age 43.

> *"To explore all types of pleasure while ensuring that I am not putting myself at serious risk for STDs."* HIV-negative partner, open agreement, age 31.

Participants who expressed sexual satisfaction goals with a relational focus emphasized both pleasure and the intimacy of relationship (n = 15, 10.3% of total sample).

> "*Being loving and intimate and mutually satisfying*" HIV-positive partner, monogamous agreement, age 52.

> *"Enjoying each other mutually and satisfying our needs."* Unsure of partners HIV status, monogamous agreement, age 34.

Intimacy Goals

Finally, a proportion of participants reported that intimacy was a large part of their sexual health goals and priorities (n = 40, 28.4%). By definition, these descriptions were relationally-focused, and emphasized connection with their primary partner.

> *"Being intimate, connected as a couple"* HIV-negative partner, open agreement, age 35.

> "*Making sure that my partner and I feel that we are connected through our sexual experiences.*" HIV-negative partner, open agreement, age 27.

> "*To feel more connected to my partner*." HIV-positive partner, monogamous agreement, age 33.

> *"Having a sense of a connection and honesty. An intimate understanding of each other.*" HIV-positive partner, open agreement, age 51.

Regardless of sexual agreement type or partner HIV status, some men also combined intimacy priorities with prevention goals.

> *"I wanna feel as close and connected with my primary partner, but also make sure that we stay HIV-negative.*" HIV-negative partner, open sexual agreement, age 32.

> "*Being as close as I can to my partner, while not getting infected with HIV since he is positive and I am not."* HIV-positive partner, monogamous agreement, age 28.

> *"To express my love physically while still maintaining my negative HIV status."* HIV-positive partner, monogamous agreement, age 25.

And finally, some participants combined all three goals in their descriptions (n = 8, 14.5% of total sample).

> *"I want to be close and connected, but I'm adamant about staying HIV negative. And I know that I need that to be fully sexually satisfied."* HIV-positive partner, open agreement, age 50.

> *"I want to stay HIV-negative, not introduce any STD's into our sexual relationship, stay close and connected to my partner."* HIV-negative partner, open agreement, age 32.

> *"I want to have as much fun as possible, be adventurous and open to new things while staying true to what I like, feeling close to my partner and allowing him the same sexual freedom that he allows me, and staying HIV-negative."* HIV-negative partner, open agreement, age 38.

Associations between Goal Content, Goal Focus, and Perceptions of Goal Congruence

The majority of participants reported prevention goals (n = 123, 84.8%), with 27.6% (n = 40) reporting intimacy goals and 37.9% (n = 55) reporting sexual satisfaction goals. Those who reported sexual satisfaction goals had significantly higher scores on perceptions of goal congruence (M = 2.30, SD = 0.97) compared to those who did not endorse this goal (M = 1.94, SD = 0.81), t(143)=2.41, p = .017,. There were no significant differences in perceptions of goal congruence among those who endorsed intimacy goals or prevention goals.

A little less than two-thirds of participants reported more self-focused goals, with over one-third describing more relationship-focused goals. Perceptions of goal congruence did not differ between participants who reported self-focused (M = 2.11, SD = 0.88) versus relationship-focused goals (M = 2.09, SD = 0.91), t(139)=-0.13, p = 0.899 (results not shown).

Correlations between Goal Content, Goal Focus, Perceptions of Goal Congruence, and Relationship Variables

As shown in Table 2, compared to participants who reported that their partner was HIV-negative, those who reported that their partner was HIV-positive were more likely to be in a monogamous sexual agreement, endorse intimacy goals, and report greater perceptions of goal congruence. Compared to those with open sexual agreements, participants who reported monogamous sexual agreements had lower risk perception scores and greater relationship satisfaction scores.

Those who endorsed prevention goals were less likely to report sexual satisfaction goals, intimacy goals and endorse relationship-focused goals. Those who reported sexual goals reported greater perceptions of goal congruence and those who reported intimacy goals were more likely to report relationship-focused goals. Greater HIV risk perception was associated with high perceptions of goal congruence. Finally, greater commitment was associated with greater relationship satisfaction and sexual satisfaction, and greater relationship satisfaction was associated with greater sexual satisfaction.

Impact of Goal Content, Goal Focus, and Perceptions of Goal Congruence on PrEP Uptake

In bivariate analyses (see Table 3), there were no significant differences in goal content or goal focus by PrEP adoption. However, PrEP adopters reported significantly higher goal congruence with their partners compared to those who declined PrEP use.

Table 3 also presents a multivariable logistic regression model examining correlates of PrEP adoption. Higher levels of perceived goal congruence with a partner was associated with an increased odds of PrEP adoption. The odds of PrEP adoption were also higher among participants whose partners were HIV-positive and participants with greater sexual satisfaction scores

Discussion

This study examined the content and focus of GBMSM's sexual health goals and priorities, as well as whether goal content, focus, or perceived congruence were associated with PrEP adoption. The results indicate that men's sexual health goals map onto three different content categories: sexual satisfaction, intimacy, and HIV/STI prevention. In expressing these goals, participants framed them with either a self-focus or a relationship-focus. In the multivariable logistic regression model,

Table 2. *Bivariate correlations between study variables (N = 145)*

	1	2	3	4	5	6	7	8	9	10	11	12
1.Partner HIV-positive[a]	–											
2.Partner Unknown Status[a]	-0.22**	–										
3.Monogamous Agreement	0.23**	-0.01	–									
4.Prevention Goals	0.01	-0.07	-0.01	–								
5.Sexual Goals	0.08	-0.05	-0.01	-0.22**	–							
6.Intimacy Goals	0.22**	-0.09	0.09	-0.38**	-0.01	–						
7.Relational Focus	0.09	-0.11	0.14	-0.41***	0.09	0.68***	–					
8.HIV Risk Perception	0.08	-0.07	-0.17*	-0.07	0.06	0.00	-0.04	–				
9.Perceptions of Goal Congruence	0.28**	0.07	-0.02	0.11	0.20*	-0.05	-0.01	0.19*	–			
10.Commitment	0.03	-0.05	0.16	0.05	0.023	-0.06	-0.06	0.04	0.14	–		
11.Relationship Satisfaction	-0.02	-0.01	0.24**	0.07	-0.01	-0.04	-0.11	0.05	-0.05	0.60***	–	
12.Sexual Satisfaction	0.03	0.09	0.09	-0.02	-0.03	0.04	0.02	0.02	-0.15	0.25**	0.43***	–

Note: a= comparison is HIV-negative partner; ***p < 0.001; **p < 0.01; *p < 0.05

Table 3. *Correlates of PrEP adoption among gay, bisexual and other men who have sex with men in primary partnerships (N=145)*

		Bivariate Comparisons			Multivariable Logistic Regression		
		PrEP Adoptions			PrEP Adoption		
	Total	Yes n=97	No n=48	Statistic	AOR	95% CI	p-value
	N (%)	N (%)	N (%)				
Race/Ethnicity				n.s.			
Black	16 (11.0)	8 (8.2)	8 (16.7)		0.30	0.06, 1.49	0.140
Latinx	29 (20.0)	24 (27.7)	5 (10.4)		1.07	0.34, 3.40	0.910
White	77 (53.1)	52 (53.6)	25 (52.1)		REF	REF	REF
Other	23 (15.9)	13 (13.4)	10 (20.8)		0.74	0.22, 2.56	0.638
Sexual Identity				n.s.			
Gay	110 (76.4)	75 (78.1)	35 (72.9)		REF	REF	REF
Bisexual	19 (13.2)	11 (11.5)	8 (16.7)		0.31	0.08, 1.18	0.085
Other	15 (10.4)	10 (10.4)	5 (10.4)		0.70	0.15, 3.23	0.642
Less than Bachelor's Degree	50 (34.5)	35 (36.1)	15 (31.3)	n.s.	0.64	0.25, 1.61	0.341
Less than $20,000 annually	47 (32.9)	33 (34.4)	14 (29.8)	n.s.	–	–	–
Open Sexual Agreement	100 (69.0)	70 (72.2)	30 (62.5)	n.s.	0.43	0.25, 1.61	0.341
Partner HIV Status				$\chi^2(2)=11.21$**			
HIV-positive	48 (33.1)	41 (42.3)	7 (14.6)		**3.07**	**1.08, 8.75**	**0.036**
HIV-negative	84 (57.9)	48 (49.5)	36 (75.0)		REF	REF	REF
Not Sure	13 (9.0)	8 (8.2)	5(10.4)		0.43	0.09, 1.98	0.279
Any CAS with Casual Partners	102 (70.3)	71 (73.2)	31 (64.6)		–	–	–
Goal Content							
Intimacy	40 (27.6)	28 (28.9)	12 (25.0)	n.s.	1.32	0.34, 5.07	0.689
Sexual	55 (37.9)	38 (39.2)	17 (35.4)	n.s.	0.72	0.30, 1.74	0.468
Prevention	123 (84.8)	85 (87.6)	38 (79.2)	n.s.	REF	REF	REF
Goal Focus				n.s.			
Personal	85 (60.3)	62 (63.9)	23 (52.3)		REF	REF	REF
Relational	56 (39.7)	35 (36.1)	21 (47.7)		0.38	0.11, 1.34	0.132
	M (SD)	M (SD)	M (SD)	Test Statistics			
Age	34.30 (8.96)	33.86 (8.84)	35.21 (9.21)	n.s.	1.02	0.97, 1.07	0.488
HIV Risk Perception	25.82 (25.18)	30.25 (25.65)	16.68 (21.71)	t(142)=3.12**	1.01	0.99, 1.03	0.323
Perceptions of Goal Congruence	2.07 (0.89)	2.24 (0.97)	1.75 (0.59)	t(143)=3.20**	**2.10**	**1.15, 3.82**	**0.015**
Relationship Commitment	19.95 (4.37)	20.11 (4.26)	19.60 (4.62)	n.s.	1.00	0.88, 1.14	0.989
Relationship Satisfaction	20.59 (5.37)	20.88 (2.30)	20.02 (5.51)	n.s.	1.10	0.97, 1.24	0.139
Sexual Satisfaction	2.51 (1.0)	2.57 (1.02)	2.38 (0.96)	n.s.	**1.84**	**1.09, 3.10**	**0.022**

Note: CAS = Casual anal sex; **$p < 0.01$

perceptions of goal congruence with a primary partner were associated with PrEP adoption. These findings underscore the critical role of intimate relationships in the conceptualization of sexual health goals for gay and bisexual men, as well as potential implications for promoting PrEP adoption among GBMSM in primary partnerships.

The first aim of this study was to understand the content and focus of HIV-negative GBMSM's reports of their sexual health goals and priorities. Consistent with the broader HIV prevention literature [23, 24, 55], men described their sexual health goals in terms of prevention, satisfaction, and intimacy. Many of the men described their sexual health goals in terms of HIV and STI prevention with a self-focus – that is, to keep oneself HIV-negative and not acquire other STIs. Similar to prevention goals, the majority of men described satisfaction goals with a self-focus and expressed a desire to balance

their sexual desires and stay HIV-negative. Notably, a small number of individuals reported prevention or satisfaction goals with a relationship-focus that incorporated their partner's sexual health. That is, men described their goals in terms of satisfying their own and their partners' sexual desires and needs. The final goal was intimacy, a goal that has been found in prior research on PrEP adoption among GBMSM in primary partnerships and which, by definition, was relationship-focused and emphasized connection, honesty, and trust [43]. These qualitative findings illustrate important and meaningful distinctions in men's sexual health goals and motivations for initiating and sustaining HIV prevention behaviors, such as PrEP.

A few notable differences in goal content by couple's HIV-status emerged in the qualitative analyses. Specifically, men in serodiscordant relationships were more likely to express intimacy goals, and those who endorsed intimacy goals were also more likely to have a relationship-focus to their sexual health goals. These men described a strong desire to feel close and connected to their partner while simultaneously protecting themselves from HIV. Notably, there were no significant bivariate differences in goal content or focus by sexual agreement type, which suggests that, regardless of the behaviors couples engage in together or separately, their motivations may be driven by prevention, satisfaction, or intimacy goals. In accordance with interdependence theory [19] and prior research supporting the importance of goal congruence [7], these qualitative findings suggest that men's sexual health goals are often described in regards to their intimate, relational context. More in-depth qualitative studies with both members of a couple are needed to better understand the relationship type nuances in goal content and focus to inform outreach efforts that are necessary to increase the adoption of HIV prevention behaviors.

Surprisingly, men who reported satisfaction goals had higher perceptions of goal congruence with their partner; whereas, there were no differences in perceptions of goal congruence among those who reported prevention or intimacy goals. It has been suggested that one of the driving factors that may promote PrEP uptake is enhancing one's sexual desires and needs while protecting oneself from HIV [43, 44, 46]. Thus, it is plausible that the men in primary partnerships who endorsed satisfaction goals may have more open conversations about their sexual desires and needs with their partner in the context of deciding whether or not to take PrEP compared to those with prevention or intimacy goals. Another possibility is that satisfaction goals were primarily self-focused and that both men in the relationship may be on the "same page" about these goals. This interpretation is also corroborated by results from the multivariable model, which illustrated that greater reports of sexual satisfaction was associated with an increased odds of PrEP adoption. These findings suggest that men's goals do not necessarily need to be driven by prevention goals or goals that are relational in nature to be congruent with their partner. As such, desires for a satisfying and fulfilling sex life may be an important goal for men in adopting PrEP as their prevention strategy.

Consistent with prior research [7], perceptions of goal congruence may be the most important factor in predicting health and well-being. In particular, findings from the multivariable model demonstrate that greater perceptions of goal congruence were associated with PrEP adoption, over and above goal focus and other relationship and sociodemographic factors. Regardless of the goal content or focus, men in primary partnerships who perceived that their sexual health goals were aligned with their partners' had a greater odds of PrEP adoption. A large body of literature has illustrated that greater amounts of similarity between partners can have positive effects on relationship well-being [56, 57]. Our findings suggest that perceptions of goal congruence may also have health and relationship benefits in the context of PrEP. Research on close relationships in the context of HIV prevention for GBMSM has focused on factors related to sexual agreements, such as attitudes, values, motivations, rather than perceptions of goal congruence in sexual health decision- making contexts. However, our findings suggest that perceptions of goal congruence may be more beneficial in the context of PrEP adoption for men in primary partnerships. That is, those with high levels of perceptions of goal congruence may engage in interpersonal strategies to help each other attain their sexual health goals, regardless of their partners' HIV status or sexual agreement type.

Limitations and Future Directions

The findings from this mixed-methods study suggest that perceptions of goal congruence were associated with PrEP adoption. However, we collected data from only one partner, which limits our ability to draw inferences about the specific dynamics between couples and whether perceptions or actual goal congruence between partners are most strongly associated with PrEP adoption. It is also possible that both members of a couple were enrolled in our study; that is, in the case of seroconcordant negative couples. Although we did not recruit couples, we also did not ask participants whether or not their partner had participated in the study, so it is possible that not all of our observations are independent in the analytic sample. The goal congruence measure demonstrated good psychometric properties in this sample; however, further research is needed to validate the adapted scale.

Additionally, participants were enrolled in a demonstration project in New York City in which PrEP was available to them free of charge, which may limit the generalizability of these findings. Some of the measures used in the study have limitations to mention. Specifically, we used an abbreviated measure of commitment, which has been used in prior studies [20]; however, this measure does not capture each aspect of commitment level as proposed in the Investment Model of Commitment [19]. Future research might examine the extent to which different aspects of commitment level (e.g., investment size, quality of alternatives) are associated with perceptions of goal congruence, and whether perceptions of goal congruence subsequently predict PrEP adoption. All the participants in this study reported that their primary partner was a man when asked about gender identity. Thus, future research is warranted to understand whether there may be differences in these associations among GBMSM in relationships with partners of other gender identities. Finally, these data are cross-sectional and cannot discern whether goal congruence predicts PrEP adoption. Future longitudinal research is warranted to understand the temporality of these associations.

Conclusions

Despite these limitations, the findings of the present study underscore the importance of understanding health goals in the context of intimate relationship contexts. This study fills important gaps in the current literature on dimensions of relationship quality and PrEP adoption by providing evidence that the conceptualization and potentially the coordination of goals with a primary partner occurs in the context of sexual health decision-making. In fact, perceptions of goal congruence with one's partner were uniquely associated with PrEP adoption, over and above the focus or content of the goal, as well as other indicators of relationship quality. More generally, the findings have theoretical and practical implications. Regarding theory, the study findings support the critical role of intimate partners in goal pursuit when understanding health behavior change and well-being [7, 9, 19]. Future longitudinal research is warranted to investigate whether perceptions of goal congruence mediates associations between indicators of relationship quality and subsequent PrEP adoption. Adding discussions of content and focus of goals, as well as perceptions of goal congruence, has the potential to enhance HIV prevention interventions and PrEP programs designed for GBMSM in primary partnerships. Evidence suggests that partners play an important role in adherence and persistence to health behaviors [58–61]. Interventions designed to understand the complexity of men's goals and their perceptions of goal congruence may be an important strategy to meet the needs of GBMSM in primary partnerships.

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Sexual goals and perceptions of goal congruence in individuals' PrEP adoption decisions: A mixed-methods study of gay and bisexual men who are in primary relationships.

Compliance with Ethical Standard

Conflicts of Interest: Each of the authors declare that they have no conflict of interest

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

References

1. Glanz K, Rimer B, Viswanath K. *Health Behaviour and Health Education: Theory, Research and Practice*. 4th ed. San Francisco, CA: Jossey: Bass; 2008.
2. Bandura A. Self-regulation of motivation through anticipatory and self-regulatory mechanisms. In: Dienstbier RA, ed. *Perspectives on Motivation: Nebraska Symposium on Motivation*. Vol. 38. Lincoln: University of Nebraska Press; 1991:69–164.
3. Deiner E. Subjective well-being. *Psychol Bull*. 1984;95:542–575.
4. Brunstein JC. Personal goals and subjective well-being - A longitudinal study. *J Pers Soc Psychol*. 1993;65:1061–1070.
5. King LA. Interventions for enhancing subjective well-being: Can we make people happier or should we? In: Eid M, Larsen RJ, eds. *The Science of Subjective Well-being*. New York, NY: The Guildord Press; 2008:431–448.
6. Riediger M, Freund AM. Interference and facilitation among personal goals: Differential associations with subjective well-being and persistent goal pursuit. *Pers Soc Psychol Bull*. 2004;30:1511–1523.
7. Gere J, Schimmack U, Pinkus RT, Lockwood P. The effects of romantic partners' goal congruence on affective well-being. *J Res Pers*. 2011;45:549–559.
8. Bohns VK, Lucas GM, Molden DC, et al. Opposites fit: Regulatory focus complemtarity and relationship well-being. *Soc Cogn*. 2013;31:1–14.

9. Lewis MA, McBride CM, Pollak KI, Puleo E, Butterfield RM, Emmons KM. Understanding health behavior change among couples: An interdependence and communal coping approach. *Soc Sci Med.* 2006;62:1369–1380.
10. Kiecolt-Glaser JK, Newton TL. Marriage and health: His and hers. *Psychol Bull.* 2001;127:472–503.
11. Lewis MA, Butterfield RM. Social control in marital relationships: Effects of one's partner on health behaviors. *J Appl Soc Psychol*. 2007;37:298–319.
12. Umberson D. Gender, marital status and the social control of health behavior. *Soc Sci Med.* 1992;34:907–917.
13. Burke TJ, Segrin C. Examining diet- and exercise-related communication in romantic relationships: Associations with health behaviors. *Health Commun.* 2014;29:877–887.
14. Westmaas JL, Wild TC, Ferrence R. Effects of gender in social control of smoking cessation. *Health Psychol.* 2002;21:368–376.
15. Markey CN, Gomel JN, Markey PM. Romantic relationships and eating regulation: An investigation of partners' attempts to control each others' eating behaviors. *J Health Psychol.* 2008;13:422–432.
16. Homish GG, Leonard KE. Spousal influence on smoking behaviors in a US community sample of newly married couples. *Soc Sci Med*. 2005;61:2557–2567.
17. Impett EA, Gable SL, Peplau LA. Giving up and giving in: The costs and benefits of daily sacrifice in intimate relationships. *J Pers Soc Psychol.* 2005;89:327–344.
18. Kelley HH, Thibaut JW. *Interpersonal Relations: A Theory of Interdependence*. New York: Wiley; 1978.
19. Rusbult CE, Van Lange PA. Interdependence, interaction, and relationships. *Annu Rev Psychol.* 2003;54:351–375.
20. Agnew CR, Van Lange PAM, Rusbult CE, Langston CA. Cognitive interdependence: Commitment and the mental representation of close relationships. *J Pers Soc Psychol*. 1998;74:939–954.
21. Sullivan PS, Salazar L, Buchbinder S, Sanchez TH. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *Aids*. 2009;23:1153–1162.
22. Goodreau SM, Carnegie NB, Vittinghoff E, et al. What drives the US and Peruvian HIV epidemics in men who have sex with men (MSM)? *Plos One.* 2012;7:e50522.
23. Golub SA, Starks TJ, Payton G, Parsons JT. The critical role of intimacy in the sexual risk behaviors of gay and bisexual men. *AIDS Behav.* 2012;16:626–632.
24. Cusick L, Rhodes T. Sustaining sexual safety in relationships: HIV-positive people and their sexual partners. *Cult Health Sex*. 2000;2:473–487.
25. Darbes LA, Chakravarty D, Neilands TB, Beougher SC, Hoff CC. Sexual risk for HIV among gay male couples: A longitudinal study of the impact of relationship dynamics. *Arch Sex Behav*. 2014;43:47–60.
26. Mitchell JW, Harvey SM, Champeau D, Seal DW. Relationship factors associated with HIV risk among a sample of gay male couples. *AIDS Behav*. 2012;16:404–411.
27. Gamarel KE, Starks TJ, Dilworth TB, et al. Personal or relational? Examining sexual health in the context of HIV serodiscordant same-sex male couples. *AIDS Behav*. 2014;18:171–179.
28. Theodore PS, Durán RE, Antoni MH, Fernandez MI. Intimacy and sexual behavior among HIV-positive men-who-have-sex-with-men in primary relationships. *AIDS Behav.* 2004;8:321–331.
29. Starks TJ, Gamarel KE, Johnson MO. Relationship characteristics and HIV transmission risk in same-sex male couples in HIV serodiscordant relationships. *Arch Sex Behav.* 2014;43:139–147.
30. Hoff CC, Chakravarty D, Beougher SC, Darbes LA, Dadasovich R, Neilands TB. Serostatus differences and agreements about sex with outside partners among gay male couples. *AIDS Educ Prev.* 2009;21:25–38.
31. Parsons JT, Starks TJ, DuBois S, Grov C, Golub SA. Alternatives to monogamy among gay male couples in a community survey: Implications for mental health and sexual risk. *Arch Sex Behav.* 2013;42:303–312.
32. Hoff CC, Beougher SC. Sexual agreements among gay male couples. *Arch Sex Behav.* 2010;39:774–787.
33. Hoff CC, Beougher SC, Chakravarty D, Darbes LA, Neilands TB. Relationship characteristics and motivations behind agreements among gay male couples: Differences by agreement type and couple serostatus. *AIDS Care.* 2010;22:827–835.
34. Mitchell JW. Characteristics and allowed behaviors of gay male couples' sexual agreements. *J Sex Res.* 2014;51:316–328.
35. Stephenson R, White D, Mitchell JW. Sexual agreements and perception of HIV prevalence among an online sample of partnered men who have sex with men. *Arch Sex Behav*. 2015;44:1813–1819.
36. Stephenson R, White D, Darbes LA, Hoff CC, Sullivan P. HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS Behav.* 2014;19:553–560.
37. Mitchell JW, Lee JY, Woodyatt C, Bauermeister J, Sullivan P, Stephenson R. Perceived challenges and rewards of forming a sexual agreement among HIV-negative male couples. *Arch Sex Behav*. 2016;45:1525–1534.
38. Hoff CC, Campbell CK, Chakravarty D, Darbes LA. Relationship-sased predictors of sexual risk for HIV among MSM couples: A systematic review of the literature. *AIDS Behav.* 2016;20:2873–2892.
39. Stephenson R, Grabbe KL, Sidibe T, McWilliams A, Sullivan PS. Technical assistance needs for successful implementation of Couples HIV Testing and Counseling (CHTC) intervention for male couples at US HIV testing sites. *AIDS Behav.* 2016;20:841–847.
40. Sullivan PS, White D, Rosenberg ES, et al. Safety and acceptability of couples HIV testing and counseling for US men who have sex with men: A randomized prevention study. *J Int Assoc Provid AIDS Care.* 2014;13:135–144.
41. Volk JE, Marcus JL, Phengrasamy T, et al. No new HIV infections with increasing use of HIV preexposure prophylaxis in a clinical practice setting. *Clin Infect Dis.* 2015;61:1601–1603.
42. Gamarel KE, Golub SA. Closeness discrepancies and intimacy interference: Motivations for HIV prevention behavior in primary romantic relationships. *Pers Soc Psychol Bull.* 2019;45:270–283.
43. Malone J, Syverston JL, Johnson BE, Mimiaga MJ, Mayer KH, Bazzi AR. Negotiating sexual safety in the era of biomedical HIV prevention: Relationship dynamics among male couples using pre-exposure prophylaxis. *Cult Health Sex*. 2018;20:658–672.
44. Hoff CC, Deepalika C, Bircher AE, et al. Attitudes towards PrEP and anticipated condom use among concordant HIV-negative and HIV-discordant male couples. *AIDS Patient Care STDs*. 2015;29:408–417.
45. John SA, Starks TJ, Rendina HJ, Grov C, Parsons JT. Should i convince my partner to go on pre-exposure prophylaxis (PrEP)? The role of personal and relationship factors on PrEP-related social control among gay and bisexual men. *AIDS Behav*. 2018;22:1239–1252.

46. Calabrese SK, Underhill K. How stigma surrounding the use of HIV preexposure prophylaxis undermines prevention and pleasure: A call to destigmatize "truvada whores". *Am J Public Health.* 2015;105:1960–1964.
47. Saberi P, Gamarel KE, Neilands TB, et al. Ambiguity, ambivalence, and apprehensions of taking HIV-1 pre-exposure prophylaxis among male couples in San Francisco: A mixed methods study. *Plos One.* 2012;7:e50061.
48. Mitchell JW, Sophus AI, Petroll AE. HIV-negative partnered men's willingness to use non-occupational post-exposure prophylaxis and associated factors in a U.S. sample of HIV-negative and HIV-discordant male couples. *LGBT Health*. 2016;3:146–152.
49. Donnell D, Mimiaga MJ, Mayer K, Chesney M, Koblin B, Coates T. Use of non-occupational post-exposure prophylaxis does not lead to an increase in high risk sex behaviors in men who have sex with men participating in the EXPLORE trial. *AIDS Behav.* 2010;14:1182–1189.
50. Tabachnick BG, Fidell LS. Using *Multivariate* Statistics. 4th ed. 2001. Boston, MA: Allyn and Bacon.
51. Rusbult CE, Martz JM, Agnew CR. The investment model scale: Measuring commitment level, satisfaction level, quality of alternatives, and investment size. *Pers Relatsh*. 1998;5:357–387.
52. Snell WE, Fisher TD, Walters AS. The multidimensional sexuality questionnaire: An objective self-report measure of psychological tendencies associated with human sexuality. *Ann Sex Res*. 1993;6:27–55.
53. Golub SA, Gamarel KE, Rendina HJ, Surace A, Lelutiu-Weinberger CL. From efficacy to effectiveness: Facilitators and barriers to PrEP acceptability and motivations for adherence among MSM and transgender women in New York City. *AIDS Patient Care STDS*. 2013;27:248–254.
54. Golub SA. Tensions between the epidemiology and psychology of HIV risk: Implications for pre-exposure prophylaxis. *AIDS Behav.* 2014;18:1686–1693.
55. Gamarel KE, Golub SA. Intimacy motivations and pre-exposure prophylaxis (PrEP) adoption intentions among HIV-negative men who have sex with men (MSM) in romantic relationships. *Ann Behav Med*. 2014;49:177–186.
56. Berscheid E. Interpersonal attraction. In: Lindzey G, Aronson E, eds. *Handbook of Social Psychology*. 3rd ed. New York: Random Hose; 1985:413–484.
57. Byrne D. *The Attraction Paradigm*. New York: Academic:1971.
58. Johnson MO, Dilworth SE, Taylor JT, et al. Primary relationships, HIV treatment adherence, and virologic control. *AIDS Behav.* 2012:16:1511–1521.
59. DiMatteo MR. Social support and patient adherence to medical treatment: A meta-analysis. *Health Psychol.* 2004;23:207–218.
60. Trivedi RB, Ayotte B, Edelman D, Bosworth HB. The association of emotional well-being and marital status with treatment adherence among patients with hypertension. *J Behav Med.* 2008;31:489–497.
61. Trief PM, Ploutz-Snyder R, Britton KD, Weinstock RS. The relationship between marital quality and adherence to the diabetes care regimen. *Ann Behav Med.* 2004;27:148–154.